Statement of Basis

Permit to Construct No. P-2017.0008
Project ID 62249

Crookham Company
Caldwell, Idaho

Facility ID 027-00020

Final

August 23 2019
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Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
acfm	actual cubic feet per minute
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
BMP	best management practices
Btu	British thermal units
CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CAS No.	Chemical Abstracts Service registry number
CBP	concrete batch plant
CEMS	continuous emission monitoring systems
cfm	cubic feet per minute
CFR	Code of Federal Regulations
CI	compression ignition
CMS	continuous monitoring systems
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	CO_2 equivalent emissions
COMS	continuous opacity monitoring systems
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
FEC	Facility Emissions Cap
GACT	Generally Available Control Technology
gph	gallons per hour
gpm	gallons per minute
gr	grains (1 lb = 7,000 grains)
HAP	hazardous air pollutants
HHV	higher heating value
HMA	hot mix asphalt
hp	horsepower
hr/yr	hours per consecutive 12 calendar month period
ICE	internal combustion engines
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
iwg	inches of water gauge
km	kilometers
lb/hr	pounds per hour
lb/qtr	pound per quarter
m	meters
MACT	Maximum Achievable Control Technology
mg/dscm	milligrams per dry standard cubic meter
MMBtu	million British thermal units
MMscf	million standard cubic feet
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards

O&M	operation and maintenance
O_2	oxygen
PAH	polyaromatic hydrocarbons
PC	permit condition
PCB	polychlorinated biphenyl
PERF	Portable Equipment Relocation Form
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
ppm	parts per million
ppmw	parts per million by weight
PSD	Prevention of Significant Deterioration
psig	pounds per square inch gauge
PTC	permit to construct
PTC/T2	permit to construct and Tier II operating permit
PTE	potential to emit
PW	process weight rate
RAP	recycled asphalt pavement
RFO	reprocessed fuel oil
RICE	reciprocating internal combustion engines
Rules	*Rules for the Control of Air Pollution in Idaho*
scf	standard cubic feet
SCL	significant contribution limits
SIP	State Implementation Plan
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
SO_x	sulfur oxides
T/day	tons per calendar day
T/hr	tons per hour
T/yr	tons per consecutive 12 calendar month period
T2	Tier II operating permit
TAP	toxic air pollutants
TEQ	toxicity equivalent
T-RACT	Toxic Air Pollutant Reasonably Available Control Technology
ULSD	ultra-low sulfur diesel
U.S.C.	United States Code
VOC	volatile organic compounds
yd^3	cubic yards
$\mu g/m^3$	micrograms per cubic meter

FACILITY INFORMATION

Description

Crookham Company is a seed processing facility located in Caldwell, Idaho. The facility processes a multitude of seed types from both local and foreign suppliers. Seed processing includes husking, shelling, scalping, drying, sizing, and packaging.

Permitting History

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

January 18, 2002	Tier II Operating Permit No. 027-00020, Initial T2 permit for the Northern Ada County PM_{10} Maintenance Plan, Permit status (S)
June 6, 2005	P-040002, PTC to increase production and hours of operation limits, Permit status (S)
May 11, 2017	P-2017.0008, PTC to include existing fumigation operations into the permit. Permit status (A, but will become S upon issuance of this permit)

Application Scope

This PTC is for a minor modification at an existing minor facility. The applicant has proposed to increase the daily and annual throughput of raw material, remove the annual operating hours for all processes, add daily phosphine limits, and add seventeen natural gas-fired dryers.

Application Chronology

June 10, 2019	DEQ received an application and an application fee.
June 18, 2019 – July 3, 2019	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
July 3, 2019	DEQ determined that the application was complete.
July 12, 2019	DEQ made available the draft permit and statement of basis for peer and regional office review.
July 18, 2019	DEQ made available the draft permit and statement of basis for applicant review.
August 20, 2019	DEQ received the permit processing fee.
August 23, 2019	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 1 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Sources	Control Equipment
Seed Processing Operations	Husking Shed 7: Baghouse Husking Shed 11: Baghouse Sheller: Baghouse Scalper Building 4: Baghouse Building 26 Electronic Sorting: Baghouse Building 26 Treating and Bagging: Baghouse Seed Vault: Baghouse Mill Building 3 : Eight Cyclones
Two Fumigation Chambers	None
Natural Gas Dryer No. of Units: 7 Manufacturer: Eclipse Airheat Model: 7244 Manufacture Date: 6/1/2018 Heat input rating: 3.75 MMBtu/hr Fuel: Natural gas	None
Natural Gas Dryer No. of Units: 2 Manufacturer: Eclipse Airheat Model: 7244 Manufacture Date: 6/1/2018 Heat input rating: 4.5 MMBtu/hr Fuel: Natural gas	
Natural Gas Dryer No. of Units: 6 Manufacturer: Eclipse Airheat Model: 7244 Manufacture Date: 6/1/2018 Heat input rating: 5 MMBtu/hr Fuel: Natural gas	
Natural Gas Dryer No. of Units: 2 Manufacturer: Eclipse Airheat Model: 7244 Manufacture Date: 6/1/2018 Heat input rating: 9 MMBtu/hr Fuel: Natural gas	
Fugitive Dust	Fugitive Dust Control Plan

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the husking shed, sheller, scalper, sizer's, mills, electric sorting, seed vault, treater and bag line, and seventeen natural gas dryer operations at the facility (see Appendix A) associated with this proposed project. Emissions estimates of criteria pollutant, HAP PTE were based on emission factors from AP-42 Section 9.9.1-1 and 1.4, operation of 25,000 T/year and 600 T/day of raw product, and process information specific to the facility for this proposed project.

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria pollutants from all emissions units at the facility being modified as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 2 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	PM_{10}		SO_2		NO_X		CO		VOC	
	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]	lb/hr[(a)]	T/yr[(b)]
Receiving	2.46E-01	1.18E-01	-	-	-	-	-	-	-	-
Husking	1.81E-02	8.37E-03	-	-	-	-	-	-	-	-
Sheller	2.46E-02	1.07E-02	-	-	-	-	-	-	-	-
Scalper	2.09E-03	2.01E-03	-	-	-	-	-	-	-	-
Cyclone 4W1	1.70E-03	2.54E-03	-	-	-	-	-	-	-	-
Cyclone 4W2	1.70E-03	2.54E-03	-	-	-	-	-	-	-	-
Cyclone 6E1	7.43E-03	1.11E-02	-	-	-	-	-	-	-	-
Cyclone 6E2	7.43E-03	1.11E-02	-	-	-	-	-	-	-	-
Cyclone 6W1	4.95E-03	7.37E-03	-	-	-	-	-	-	-	-
Cyclone 6W2	4.95E-03	7.43E-03	-	-	-	-	-	-	-	-
Cyclone 6W3	4.95E-03	7.43E-03	-	-	-	-	-	-	-	-
Cyclone 5E	2.42E-03	3.64E-03	-	-	-	-	-	-	-	-
Sorting (E1)	7.65E-04	4.59E-04	-	-	-	-	-	-	-	-
Bagging	1.12E-02	2.43E-03	-	-	-	-	-	-	-	-
Dryer Burners	2.46E-01	1.18E-01	-	-	-	-	-	-	-	-
Pre-Project Totals	**0.58**	**0.31**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria pollutants from all emissions units at the facility as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 3 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{2.5}$		PM_{10}		SO_2		NO_X		CO		VOC	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
Receiving	5.00E-02	2.50E-02	2.95E-01	1.48E-01	-	-	-	-	-	-	-	-
Husking	3.08E-03	2.22E-03	1.81E-02	1.31E-02	-	-	-	-	-	-	-	-
Sheller (Large)	4.17E-03	1.12E-03	2.46E-02	6.62E-03	-	-	-	-	-	-	-	-
Sheller (Small)	2.90E-03	1.25E-04	1.12E-02	1.90E-03	-	-	-	-	-	-	-	-
Scalper	3.56E-04	1.17E-03	2.09E-03	6.92E-03	-	-	-	-	-	-	-	-
Mill 1	0.03	4.01E-03	0.16	2.36E-02	-	-	-	-	-	-	-	-
Mill 2	0.03	4.01E-03	0.16	2.36E-02	-	-	-	-	-	-	-	-
Mill 3	0.02	4.01E-03	0.11	2.36E-02	-	-	-	-	-	-	-	-
Mill 4	7.18E-03	1.14E-03	4.23E-02	6.73E-03	-	-	-	-	-	-	-	-
Mill 5	7.18E-03	1.14E-03	4.23E-02	6.73E-03	-	-	-	-	-	-	-	-
Sizer 1 East	0.01	1.47E-02	0.05	8.65E-02	-	-	-	-	-	-	-	-
Sizer 2 North	0.02	3.72E-02	0.14	2.19E-01	-	-	-	-	-	-	-	-
Sorting (E1)	1.31E-04	3.38E-04	7.65E-04	1.98E-03	-	-	-	-	-	-	-	-
Bagging	8.70E-04	3.38E-04	5.10E-03	1.98E-03	-	-	-	-	-	-	-	-
Dryers	0.62	0.19	0.62	0.19	4.90E-02	1.47E-02	8.16	2.45	6.86	2.06	4.49E-01	1.35E-01
Post Project Totals	**0.81**	**0.29**	**1.68**	**0.76**	**0.05**	**0.01**	**8.16**	**2.45**	**6.86**	**2.06**	**0.45**	**0.14**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.
c) Cyclone 4W1 and 6W2 are in series controlling emissions for Mill 4.
d) Cyclone 4W2 and 6W3 are in series controlling emissions for Mill 5.

The facility requested to change the source name from the control unit to the emission source. The following is a breakdown of the previous name convention to the current name convention. The change in name convention does not affect the emissions or emission units calculated in previous permitting actions:

Previously Permitted Source Name	Current Permitted Source Name
Cyclone 4W1 Cyclone 6W2	Mill 4
Cyclone 6E1	Mill 1
Cyclone 6E2	Mill 2
Cyclone 6W1	Mill 3
Cyclone 4W2 Cyclone 6W3	Mill 5
Cyclone 5E	Sizer 1 - East

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 4 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{2.5}$		PM_{10}		SO_2		NO_X		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	-	-	0.58	0.31	-	-	-	-	-	-	-	-
Post Project Potential to Emit	0.81	0.29	1.68	0.76	4.90E-02	1.47E-02	8.16	2.45	6.86	2.06	4.49E-01	1.35E-01
Changes in Potential to Emit	**0.81**	**0.29**	**1.10**	**0.45**	**0.05**	**0.01**	**8.16**	**2.45**	**6.86**	**2.06**	**0.45**	**0.14**

The statement of basis issued May 19, 2005, for permit number P-040002 issued June 6, 2005, is the technical analysis for the permit issued May 11, 2017. The pre-project emissions were taken from the May 19, 2005, statement of basis. During the August 23, 2019, permitting action several errors in the calculations for the May 2005 permitting action were noted. The May 2005 technical analysis assumes a total PM_{10} tpy of 1.14 per Appendix A of the S.O.B. The majority of that is consumed by the dryers (0.948 tpy). The dryer calculation assumes an hourly rate of 6.32E-01 lb. This was derived by assuming the summation of all 17 dryers operated in that hour for a total of 83.25 MMBtu/hr. The 7.6 lb/MMscf was used along with a heating value of 1000 btu/scf. 83.25 mmbtu/hr * 7.6 lb/mmsf / 1000 btu/scf = 6.33E-01 lb/hr. That value is consistent with Table 5.1 of the S.O.B and it is suspect that the slight difference in Appendix A is due to rounding.

If the dryers are removed from the 2005 data the total PM_{10} tpy is 1.95E-01. Also, the calculation methodology is consistent with the throughput values provided in Appendix A, which also match those in Table 5.1 with the exception of Receiving. Table 5.1 states that Receiving is 7.7E-01 lb/hr, while Appendix A states 2.46E-01 lb/hr. The approach used in Appendix A lays outs how the calculations were made and it is consistent with the current limits (500 tpd and 20,000 tpy). 20,000 ton/yr * 0.059 lb/ton *(1-0.8) / 2000 ton/lb = 1.18E-01 tpy. If you assume 500 tpd over 24 hr you get a controlled lb/hr for Receiving of 2.46E-01 (Appendix A). It is unclear where the 7.7E-1 lb/hr is derived, but the annual value does correlate with the current annual throughput limit of 20,000 tons.

Provided below are the PM_{10} tpy emissions from the dryers. It shows the proposed PM_{10} emissions do increase. The next decrease that is being seen is due to the dryers annual usage decreasing from 83.25 MMBtu/hr * 3,000 hr/yr = 249,750 MMBtu/yr to 50,000 MMBtu/yr. As stated above, the dryers from 2005 were 0.948 tpy. Now they are 0.186 tpy. The calculation is as follows: 50,000 MMBtu/yr *7.6 lb/MMscf / 1020 btu/scf / 2000 lb/ton = 0.186 tpy. That is a net decrease of 0.762 tpy from the dryers. The increased throughput of the other processes shows a net increase of 0.375 tpy. The May 2005 S.O.B. Table 5.1 and Appendix A list the annual tpy as 1.14. There is a total PM_{10} tpy decrease from 1.14 to 0.76 because of the reduction of dryer fuel usage throughout the year.

Table 5 PM_{10} Dryer Annual Emissions

Process	2005 (tpy)	Proposed (tpy)	Comments for Proposed #'s
Receiving	1.18E-01	1.48E-01	
Husking	8.37E-03	1.31E-02	
Sheller	1.07E-02	7.36E-03	Sum of large and small
Scalper	2.01E-03	6.92E-03	
4W1	2.54E-03	6.73E-03	Mill 4: 4W1/6W2
4W2	2.54E-03	6.73E-03	Mill 5: 4W2/6W3
6E1	1.11E-02	2.36E-02	Mill 1

Process	2005 (tpy)	Proposed (tpy)	Comments for Proposed #'s
6E2	1.11E-02	2.36E-02	Mill 2
6W1	7.37E-03	2.36E-02	Mill 3
6W2	7.37E-03	N/A	See Mill 4
6W3	7.37E-03	N/A	See Mill 5
Sizer 5E	3.64E-03	3.05E-01	Sum of Sizer 1 and 2
Sorting E1	4.59E-04	1.98E-03	
Bagging	2.43E-03	1.98E-03	Throughput decreases from 9510 tons to 7765
Seed Vault	N/A	3.67E-04	Only in Proposed
Total	**0.195**	**0.569**	

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of non-carcinogenic toxic air pollutants (TAP) is provided in the following table.

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 6 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Barium	0.00E-03	3.59E-04	3.59E-04	0.033	No
Chromium	0.00E-03	1.14E-04	1.14E-04	0.033	No
Cobalt	0.00E-03	6.86E-06	6.86E-06	0.0033	No
Copper	0.00E-03	6.94E-05	6.94E-05	0.067	No
Manganese	0.00E-03	3.10E-05	3.10E-05	0.333	No
Molybdenum	0.00E-03	8.98E-05	8.98E-05	0.667	No
Selenium	0.00E-03	1.96E-06	1.96E-06	0.013	No
Vanadium	0.00E-03	1.88E-04	1.88E-04	0.003	No
Zinc	0.00E-03	2.37E-03	2.37E-03	0.667	No
Hexane	0.00E-03	1.47E-01	1.47E-01	12	No
Pentane	0.00E-03	2.12E-01	2.12E-01	118	No
Toluene	0.00E-03	2.78E-04	2.78E-04	25	No
Napthalene	0.00E-03	4.98E-05	4.98E-05	3.33	No
Phosphine	0.034	0.034	0.0000	0.027	Yes

All changes in emissions rates for non-carcinogenic TAP were below EL (screening emissions level) as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAP because none of the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded. Phosphine was modeled in P-2017.0008 issued May 11, 2017, and demonstrated compliance with the ambient air concentration levels.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 7 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Benzene	0.00E-03	1.18E-05	1.18E-05	8.00E-04	No
POM[a]	0.00E-03	6.38E-08	6.38E-08	2.00E-06	No
2-Methylnapthalene	0.00E-03	1.34E-07	1.34E-07	9.10E-05	No
3-Methylchloranthrene	0.00E-03	1.01E-08	1.01E-08	9.10E-05	No
Acenaphthene	0.00E-03	1.01E-08	1.01E-08	9.10E-05	No
Acenaphthylene	0.00E-03	1.01E-08	1.01E-08	9.10E-05	No
Anthracene	0.00E-03	1.34E-08	1.34E-08	9.10E-05	No
Benzo(g,h,i)perylene	0.00E-03	6.72E-09	6.72E-09	9.10E-05	No
Dichlorobenzene	0.00E-03	6.72E-06	6.72E-06	9.10E-05	No
Fluoranthene	0.00E-03	1.68E-08	1.68E-08	9.10E-05	No
Fluorene	0.00E-03	1.57E-08	1.57E-08	9.10E-05	No
Phenanathrene	0.00E-03	9.51E-08	9.51E-08	9.10E-05	No
Pyrene	0.00E-03	2.80E-08	2.80E-08	9.10E-05	No
Forrmaldehyde	0.00E-03	4.20E-04	4.20E-04	5.10E-04	No
Napthalene	0.00E-03	3.41E-06	3.41E-06	9.10E-05	No
Arsenic	0.00E-03	1.12E-06	1.12E-06	1.50E-06	No
Beryllium	0.00E-03	6.72E-08	6.72E-08	2.80E-05	No
Cadmium	0.00E-03	6.16E-06	6.16E-06	3.70E-06	Yes
Nickel	0.00E-03	1.18E-05	1.18E-05	2.70E-05	No

a) Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

Some of the PTEs for carcinogenic TAP were exceeded as a result of this project. Therefore, modeling is required for cadmium because the annual average carcinogenic screening EL identified in IDAPA 58.01.01.586 was exceeded. Cadmium was modeled and demonstrated compliance with the ambient air concentration levels. The modeling memo demonstrating compliance can be located in Appendix B.

Post Project HAP Emissions

The following table presents the post project potential to emit for HAP pollutants from all emissions units at the facility being modified as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 8 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

Hazardous Air Pollutants	PTE (T/yr)
Benzene	5.15E-05
Dichlorobenzene	2.94E-05
Formaldehyde	1.84E-03
Hexane	4.41E-02
Naphthalene	1.50E-05
Toluene	8.33E-05
2-Methylnapthalene	5.88E-07
3-Methylchloranthrene	4.41E-08
7,12-Dimethylbenz(a)anthracene	3.92E-07
Acenaphthene	4.41E-08
Acenaphthylene	4.41E-08
Anthracene	5.88E-08
Benz(a)anthracene	4.41E-08
Benzo(a)pyrene	2.94E-08
Benzo(b)fluoranthene	4.41E-08
Benzo(g,h,i)perylene	2.94E-08
Benzo(k)fluoranthene	4.41E-08
Chrysene	4.41E-08
Dibenzo(a,h)anthracene	2.94E-08
Dichlorobenzene	2.94E-05
Fluoranthene	7.35E-08
Fluorene	6.86E-08
Indeno(1,2,3-cd)pyrene	4.41E-08
Phenanathrene	4.17E-07
Pyrene	1.23E-07
Arsenic	4.90E-06
Beryllium	2.94E-07
Cadmium	2.70E-05
Chromium	3.43E-05
Cobalt	2.06E-06
Lead	1.23E-05
Manganese	9.31E-06
Mercury	6.37E-06
Molybdenum	2.70E-05
Nickel	5.15E-05
Selenium	5.88E-07
Totals	**0.05**

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of, $PM_{2.5}$, SO_2, NO_X, CO, VOC, HAP, and TAP from this project were below applicable screening emission levels (EL) and published DEQ modeling thresholds established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact

[1] Criteria pollutant thresholds in Table 2, State of Idaho Guideline for Performing Air Quality Impact Analyses, Doc ID AQ-011, September 2013.

Analysis for TAP is provided in Appendix AB.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Canyon County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total HAPs) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 9 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	3.66	0.76	**100**	B
PM_{10}	3.66	0.76	**100**	B
$PM_{2.5}$	0.62	0.25	**100**	B
SO_2	0.01	0.01	**100**	B
NO_X	2.45	2.45	**100**	B
CO	2.06	2.06	**100**	B
VOC	0.14	0.14	**100**	B
HAP (single)	4.41E-02	4.41E-02	**10**	B
Total HAPs	0.05	0.05	**25**	B

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201 ..... Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the modified emissions source. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401 ..... Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 ..... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by Permit Conditions 2.3 and 3.3.

Particulate Matter – New Equipment Process Weight Limitations (IDAPA 58.01.01.701)

IDAPA 58.01.01.701 ..... Particulate Matter – New Equipment Process Weight Limitations

IDAPA 58.01.01.700 through 703 set PM emission limits for process equipment based on when the piece of equipment commenced operation and the piece of equipment's process weight (PW) in pounds per hour (lb/hr). IDAPA 58.01.01.701 and IDAPA 58.01.01.702 establish PM emission limits for equipment that commenced operation on or after October 1, 1979, and for equipment operating prior to October 1, 1979, respectively.

For equipment that commenced prior to October 1, 1979, the PM allowable emission rate is based on one of the following equations:

IDAPA 58.01.01.702.01.b: If PW is $\geq$ 17,000 lb/hr; $E = 1.12\ (PW)^{0.27}$

For the throughput of 25 T/hr, E is calculated as follows:

Proposed throughput = 25 T/hr x 2,000 lb/1 T = 50,000 lb/hr

Therefore, E is calculated as:

$E = 1.12 \times PW^{0.27} = 1.12 \times (50{,}000)^{0.27} = 20.8$ lb-PM/hr

As presented previously in the Emissions Inventories Section of this evaluation the post project PTE for this emissions unit is 10.4 lb-PM_{10}/hr. Assuming PM is 50% PM_{10} means that PM emissions will be 20.8 lb-PM/hr (10.4 lb-PM_{10}/hr $\div$ 0.5 lb-PM_{10}/lb-PM). Therefore, compliance with this requirement has been demonstrated.

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 ..... Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for PM_{10}, SO_2, NO_X, CO, VOC, or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 ..... Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

The facility is not subject to any NSPS requirements 40 CFR Part 60.

NESHAP Applicability (40 CFR 61)

The facility is not subject to any NESHAP requirements in 40 CFR 61.

MACT/GACT Applicability (40 CFR 63)

The facility is not subject to any MACT standards in 40 CFR Part 63.

Permit Conditions Review

This section describes the permit conditions for this modified permit or only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Existing Permit Condition 1.1

Explains this is a modified permit to construct to increase the daily and annual throughput of raw material, ad seventeen existing natural gas fired heaters, and add a daily phosphine limit.

Existing Permit Condition 1.2

Permit conditions that have been modified or revised by this permitting action are identified by the permit issue date citation located directly under the permit condition and on the right hand margin.

Existing Permit Condition 1.3

Lists the PTC being replaced with this project.

Existing Permit Condition 2.1

Process description for the seed processing operation.

Initial Permit Condition 2.2

Sets the emission limits for the seed processing operation.

Existing Permit Condition 2.3

Sets the opacity limit for the seed processing operation. The permit condition was P.C. 2.2 in the May 11, 2017 permit.

Existing Permit Condition 2.4

The 500 tons per day and the 20,000 tons of seed material per any 12-month period has been revised to reflect the requested increase of 600 tons per day and 25,000 tons per year. The permit condition was P.C. No. 2.3 in the previous permitting action.

Existing Permit Condition 2.4

In each process (receiving, husking, drying, shelling, sizing, electronic sorting, and bagging), the hours of operation shall not exceed 3,000 hours per any consecutive 12-month period (hr/yr).

This permit condition has been removed after a modeling analysis with the new throughput limits confirmed the request demonstrates compliance with NAAQS.

Initial Permit Condition 2.5

Sets the daily phosphine use limit to ensure compliance with the TAP emission level listed in 58.01.010.585 and the modeling memo drafted May 11, 2017. Phosphine was added to the facilities permit to construct May 11, 2017, however the daily limit to ensure compliance with the amount requested, modeled, and added was left off the permit. In this permitting action the facility agreed to add the daily limit along with associated monitoring and recordkeeping requirements.

Existing Permit Condition 2.6

Baghouse requirements for the seed processing operations. This permit condition was listed as P.C. No. 2.5 in the previous permitting action.

Initial Permit Condition 2.7

This permit condition incorporates the amount of final product produced per year. This quantity was also used in the modeling analysis to determine emission limits.

Existing Permit Condition 2.8

Monitoring and Recordkeeping requirements for the raw material throughput operations. This permit condition was listed as P.C. No. 2.6 in the previous permitting action.

Initial Permit Condition 2.9

Monitor and Recordkeeping Requirements for the daily phosphine permit condition.

Initial Permit Condition 2.10

This permit condition sets the monitoring requirements to demonstrate compliance with the annual final product throughput permit condition.

Initial Permit Condition 3.1

Is a process description of the seventeen natural gas fired dryers at the facility.

Initial Permit Condition 3.2

Lists the control devices for the seventeen natural gas fired dryers.

Initial Permit Condition 3.3

Lists the combined emission limits for the seventeen natural gas fired dryers.

Initial Permit Condition 3.4

Lists the grain loading standard for natural gas fired dryers.

Initial Permit Condition 3.5

Specifies natural gas as the only fuel source permitted.

Initial Permit Condition 3.6

Lists the annual natural gas fuel usage limit for all seventeen natural gas dryers combined.

Initial Permit Condition 3.7

Monitoring and record keeping requirements to demonstrate the natural gas permit conditions 3.6 and 3.5.

Existing Permit Conditions 3.1 through 3.5 for Fugitive Dust Control

This entire section was moved from section 3 to section 4 with the addition of the natural gas fired dryers in this permit modification project. None of the permit conditions other than permit condition 4.2, the 5th bullet point, were modified outside of the new numbering.

Permit Condition 4.2

The 5th bullet point was changed from certified personnel conducting a visible emission evaluation and monitoring of the receiving area to personnel conducting a see/no-see visible emission evaluation and monitoring. This is consistent with the fugitive dust visible emission monitoring among seed and grain facilities permitted with IDEQ.

The General Provisions have been updated to the current template.

Permit Condition 5.1

The duty to comply general compliance provision requires that the permittee comply with all of the permit terms and conditions pursuant to Idaho Code §39-101.

Permit Condition 5.2

The maintenance and operation general compliance provision requires that the permittee maintain and operate all treatment and control facilities at the facility in accordance with IDAPA 58.01.01.211.

Permit Condition 5.3

The obligation to comply general compliance provision specifies that no permit condition is intended to relieve or exempt the permittee from compliance with applicable state and federal requirements, in accordance with IDAPA 58.01.01.212.01.

Permit Condition 5.4

The inspection and entry provision requires that the permittee allow DEQ inspection and entry pursuant to Idaho Code §39-108.

Permit Condition 5.5

The permit expiration construction and operation provision specifies that the permit expires if construction has not begun within two years of permit issuance or if construction has been suspended for a year in accordance with IDAPA 58.01.01.211.02.

Permit Condition 5.6

The notification of construction and operation provision requires that the permittee notify DEQ of the dates of construction and operation, in accordance with IDAPA 58.01.01.211.01 and 211.03.

Permit Condition 5.7

The performance testing notification of intent provision requires that the permittee notify DEQ at least 15 days prior to any performance test to provide DEQ the option to have an observer present, in accordance with IDAPA 58.01.01.157.03.

Permit Condition 5.8

The performance test protocol provision requires that any performance testing be conducted in accordance with the procedures of IDAPA 58.01.01.157, and encourages the permittee to submit a protocol to DEQ for approval prior to testing.

Permit Condition 5.9

The performance test report provision requires that the permittee report any performance test results to DEQ within 60 days of completion, in accordance with IDAPA 58.01.01.157.04-05.

Permit Condition 5.10

The monitoring and recordkeeping provision requires that the permittee maintain sufficient records to ensure compliance with permit conditions, in accordance with IDAPA 58.01.01.211.

Permit Condition 5.11

The excess emissions provision requires that the permittee follow the procedures required for excess emissions events, in accordance with IDAPA 58.01.01.130-136.

Permit Condition 5.12

The certification provision requires that a responsible official certify all documents submitted to DEQ, in accordance with IDAPA 58.01.01.123.

Permit Condition 5.13

The false statement provision requires that no person make false statements, representations, or certifications, in accordance with IDAPA 58.01.01.125.

Permit Condition 5.14

The tampering provision requires that no person render inaccurate any required monitoring device or method, in accordance with IDAPA 58.01.01.126.

Permit Condition 5.15

The transferability provision specifies that this permit to construct is transferable, in accordance with the procedures of IDAPA 58.01.01.209.06.

Permit Condition 5.16

The severability provision specifies that permit conditions are severable, in accordance with IDAPA 58.01.01.211.

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

Processing

								Uncontrolled				Controlled			
				PM10	PM2.5	Max Throughput		PM10	PM2.5	PM10	PM2.5	PM10	PM2.5	PM10	PM2.5
Process[1]	Control	2005 Reference	% Efficient	EF lb/ton	EF lb/ton	Ton/hr	Ton/yr	lb/hr		T/yr		lb/hr		T/yr	
Receiving[2]	water spray/enclosure	Receiving	80	0.059	0.01	25.00	25,000	1.48	0.25	0.74	0.13	0.30	0.05	0.15	0.03
Husking Shed 7	Baghouse	Husking	98.5	0.093	0.0158	13	18,750	1.21	0.21	0.87	0.15	0.02	0.00	0.01	0.00
Sheller - Large	Baghouse	Sheller	98.5	0.093	0.0158	17.6	9,492	1.64	0.28	0.44	0.07	0.02	0.00	0.01	0.00
Sheller - Small	Baghouse	Sheller	98.5	0.093	0.0158	8	1,055	0.74	0.13	0.05	0.01	0.01	0.00	0.00	0.00
Scalper	Baghouse	Scalper	98.5	0.093	0.0158	1.5	9,914	0.14	0.02	0.46	0.08	0.00	0.00	0.01	0.00
Sizer 1 - East	Cyclone 5	Cyclone 5E	60.5	0.093	0.0158	1.43	4,709	0.13	0.02	0.22	0.04	0.05	0.01	0.09	0.01
Sizer 2 - North	Fan	N/A	0	0.093	0.0158	1.5	4,709	0.14	0.02	0.22	0.04	0.14	0.02	0.22	0.04
Mill 1	Cyclone 6	Cyclone 6E1	68.3	0.093	0.0158	5.43	1,601	0.50	0.09	0.07	0.01	0.16	0.03	0.02	0.00
Mill 2	Cyclone 6	Cyclone 6E2	68.3	0.093	0.0158	5.43	1,601	0.50	0.09	0.07	0.01	0.16	0.03	0.02	0.00
Mill 3	Cyclone 6	Cyclone 6W1	68.3	0.093	0.0158	3.66	1,601	0.34	0.06	0.07	0.01	0.11	0.02	0.02	0.00
Mill 4[5]	Cyclone 4 Cyclone 6	Cyclone 4W1 Cyclone 6W2	71.5/68.3	0.093	0.0158	5.03	1,601	0.47	0.08	0.07	0.01	0.04	0.01	0.01	0.00
Mill 5[5]	Cyclone 4 Cyclone 6	Cyclone 4W2 Cyclone 6W3	71.5/68.3	0.093	0.0158	5.03	1,601	0.47	0.08	0.07	0.01	0.04	0.01	0.01	0.00
Electric Sorting[3]	Baghouse	Sorting (E1)	98.5	0.034	0.0058	1.5	7,765	0.05	0.01	0.13	0.02	0.00	0.00	0.00	0.00
Treater & bagline[3]	Baghouse	Bagging	98.5	0.034	0.0058	10	7,765	0.34	0.06	0.13	0.02	0.01	0.00	0.00	0.00
Seed Vault[4]	Baghouse	N/A	98.5	0.0063	0.0011	0.02	7,765	1.26E-04	2.20E-05	2.45E-02	4.27E-03	1.89E-06	3.30E-07	3.67E-04	6.41E-05
Sack turner[6]	2-Cyclone	N/A	71.5/68.3	0.093	0.0158	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
								8.15	**1.38**	**3.66**	**0.62**	**1.06**	**0.18**	**0.57**	**0.10**

1. The majority of processes emission factors assumes a summation of handling and receiving from AP-42, Table 9.9.1-1
2. Receiving emission factor from AP-42 9.9.1-1
3. Handling emission factor from AP-42 9.9.1-1
4. Storage bin vent emission factor from AP-42 9.9.1-1
5. Mill 4, Mill 5 and Sack Turner assumes cyclones run in sequence (71.5% for first then goes to 68.3% second cyclone)
6. Emissions associated with Sack Turner are considered negligible

		Emission Weighting for Cyclone 4 and 6			
	Control Eff. (%)	PM10	PM2.5	PM10	PM2.5
Cyclone 4	71.5	0.13332	0.02265	0.021219	0.003605
Cyclone 4	71.5	0.13332	0.02265	0.021219	0.003605
Cyclone 4	71.5	0	0	0	0
Cyclone 6	68.3	0.042262	0.00718	0.006726	0.001143
Cyclone 6	68.3	0.042262	0.00718	0.006726	0.001143
Cyclone 6	68.3	0	0	0	0

Natural Gas Combustion

Criteria Pollutant	Emission Factor (lb/MMSCF)[1]
SO_2	0.6
NOx[3]	100
CO	84
Total PM[2]	7.6
VOC	5.5
Lead	0.0005
CO_2	120000
N_2O	2.2
Methane (CH_4)	2.3

NG heating value 1020 btu/scf

49,020 MMscf/yr

1. Emission factors are derived from AP-42 (1998), Section 1.4, Natural Gas Combustion, Tables 1.4-1 and 1.4-2. Small uncontrolled boilers
2. Assumes PM_{10} and $PM_{2.5}$ are equivalent.
3. Low NO_x Eclipse burners not assumed

Emission Unit	(MMBtu/hr)	SO_2	NOx	CO	$PM_{2.5}/PM_{10}$	VOC	Lead
		Pounds per Hour					
Total	83.25	4.90E-02	8.16	6.86	6.20E-01	4.49E-01	4.08E-05

Emission Unit	(MMBtu/yr)	SO_2	NOx	CO	$PM_{2.5}/PM_{10}$	VOC	Lead
		Tons per Year					
Total	50,000	1.47E-02	2.45E+00	2.06	1.86E-01	1.35E-01	1.23E-05

Non Metal HAP[2]	CAS	EF (lb/MMscf)	lb/hr	T/yr
Benzene	71-43-2	2.10E-03	1.71E-04	5.15E-05
Dichlorobenzene	25321-22-6	1.20E-03	9.79E-05	2.94E-05
Formaldehyde	50-00-0	7.50E-02	6.12E-03	1.84E-03
Hexane	110-54-3	1.80E+00	1.47E-01	4.41E-02
Naphthalene	91-20-3	6.10E-04	4.98E-05	1.50E-05
Toluene	108-88-3	3.40E-03	2.78E-04	8.33E-05
2-Methylnapthalene[1]	91-57-6	2.40E-05	1.96E-06	5.88E-07
3-Methylchloranthrene[1]	56-49-5	1.80E-06	1.47E-07	4.41E-08
7,12-Dimethylbenz(a)anthracene[1]		1.60E-05	1.31E-06	3.92E-07
Acenaphthene[1]	83-32-9	1.80E-06	1.47E-07	4.41E-08
Acenaphthylene[1]	203-96-8	1.80E-06	1.47E-07	4.41E-08
Anthracene[1]	120-12-7	2.40E-06	1.96E-07	5.88E-08
Benz(a)anthracene[1]	56-55-3	1.80E-06	1.47E-07	4.41E-08
Benzo(a)pyrene[1]	50-32-8	1.20E-06	9.79E-08	2.94E-08
Benzo(b)fluoranthene[1]	205-99-2	1.80E-06	1.47E-07	4.41E-08
Benzo(g,h,i)perylene[1]	191-24-2	1.20E-06	9.79E-08	2.94E-08
Benzo(k)fluoranthene[1]	205-82-3	1.80E-06	1.47E-07	4.41E-08
Chrysene[1]	218-01-9	1.80E-06	1.47E-07	4.41E-08
Dibenzo(a,h)anthracene[1]	53-70-3	1.20E-06	9.79E-08	2.94E-08
Dichlorobenzene[1]	25321-22-6	1.20E-03	9.79E-05	2.94E-05
Fluoranthene[1]	206-44-0	3.00E-06	2.45E-07	7.35E-08
Fluorene[1]	86-73-7	2.80E-06	2.29E-07	6.86E-08
Indeno(1,2,3-cd)pyrene[1]	193-39-5	1.80E-06	1.47E-07	4.41E-08
Phenanathrene[1]	85-01-8	1.70E-05	1.39E-06	4.17E-07
Pyrene[1]	129-00-0	5.00E-06	4.08E-07	1.23E-07

1. The pollutant is a HAP because it is considered a polycyclic organic matter (POM).
2. Emission factors are based on AP-42 (1998), Section 1.4, Natural Gas Combustion, Table 1.4-3.

Metal HAP[1]	CAS	EF (lb/MMscf)	lb/hr	T/yr
Arsenic	7440-38-2	2.00E-04	1.63E-05	4.90E-06
Beryllium	7440-41-7	1.20E-05	9.79E-07	2.94E-07
Cadmium	7440-43-9	1.10E-03	8.98E-05	2.70E-05
Chromium	7440-47-3	1.40E-03	1.14E-04	3.43E-05
Cobalt	7440-48-4	8.40E-05	6.86E-06	2.06E-06
Lead	7439-92-1	5.00E-04	4.08E-05	1.23E-05
Manganese	7439-96-5	3.80E-04	3.10E-05	9.31E-06
Mercury	7439-97-6	2.60E-04	2.12E-05	6.37E-06
Molybdenum	7439-98-7	1.10E-03	8.98E-05	2.70E-05
Nickel	7440-02-0	2.10E-03	1.71E-04	5.15E-05
Selenium	7782-49-2	2.40E-05	1.96E-06	5.88E-07

1. Emission factors are based on AP-42 (1998), Section 1.4, Natural Gas Combustion, Table 1.4-4.

Total HAP **4.63E-02**

Dryers NG

Idaho State TAP	CAS	585/586	EF (lb/MMscf)	Max lb/hr	Max (T/yr)	24-hr or Annual Average (lb/hr)[3]	ID Emission Level	Modeling?
Benzene	71-43-2	586	2.10E-03	1.71E-04	5.15E-05	1.18E-05	8.00E-04	No
POM[1]		586	1.14E-05	9.30E-07	2.79E-07	6.38E-08	2.00E-06	No
2-Methylnapthalene[2]	91-57-6	586	2.40E-05	1.96E-06	5.88E-07	1.34E-07	9.10E-05	No
3-Methylchloranthrene[2]	56-49-5	586	1.80E-06	1.47E-07	4.41E-08	1.01E-08	9.10E-05	No
Acenaphthene[2]	83-32-9	586	1.80E-06	1.47E-07	4.41E-08	1.01E-08	9.10E-05	No
Acenaphthylene[2]	203-96-8	586	1.80E-06	1.47E-07	4.41E-08	1.01E-08	9.10E-05	No
Anthracene[2]	120-12-7	586	2.40E-06	1.96E-07	5.88E-08	1.34E-08	9.10E-05	No
Benzo(g,h,i)perylene[2]	191-24-2	586	1.20E-06	9.79E-08	2.94E-08	6.72E-09	9.10E-05	No
Dichlorobenzene[2]	25321-22-6	586	1.20E-03	9.79E-05	2.94E-05	6.72E-06	9.10E-05	No
Fluoranthene[2]	206-44-0	586	3.00E-06	2.45E-07	7.35E-08	1.68E-08	9.10E-05	No
Fluorene[2]	86-73-7	586	2.80E-06	2.29E-07	6.86E-08	1.57E-08	9.10E-05	No
Phenanathrene[2]	85-01-8	586	1.70E-05	1.39E-06	4.17E-07	9.51E-08	9.10E-05	No
Pyrene[2]	129-00-0	586	5.00E-06	4.08E-07	1.23E-07	2.80E-08	9.10E-05	No
Formaldehyde	50-00-0	586	7.50E-02	6.12E-03	1.84E-03	4.20E-04	5.10E-04	No
Napthalene	91-20-3	586	6.10E-04	4.98E-05	1.50E-05	3.41E-06	9.10E-05	No
Arsenic	7440-38-2	586	2.00E-04	1.63E-05	4.90E-06	1.12E-06	1.50E-06	No
Beryllium	7440-41-7	586	1.20E-05	9.79E-07	2.94E-07	6.72E-08	2.80E-05	No
Cadmium	7440-43-9	586	1.10E-03	8.98E-05	2.70E-05	6.16E-06	3.70E-06	Yes
Nickel	7440-02-0	586	2.10E-03	1.71E-04	5.15E-05	1.18E-05	2.70E-05	No
Barium	7440-39-3	585	4.40E-03	3.59E-04	1.08E-04	3.59E-04	0.033	No
Chromium	7440-47-3	585	1.40E-03	1.14E-04	3.43E-05	1.14E-04	0.033	No
Cobalt	7440-48-4	585	8.40E-05	6.86E-06	2.06E-06	6.86E-06	0.0033	No
Copper	7440-50-8	585	8.50E-04	6.94E-05	2.08E-05	6.94E-05	0.067	No
Manganese	7439-96-5	585	3.80E-04	3.10E-05	9.31E-06	3.10E-05	0.333	No
Molybdenum	7439-98-7	585	1.10E-03	8.98E-05	2.70E-05	8.98E-05	0.667	No
Selenium	7782-49-2	585	2.40E-05	1.96E-06	5.88E-07	1.96E-06	0.013	No
Vanadium	7440-62-2	585	2.30E-03	1.88E-04	5.64E-05	1.88E-04	0.003	No
Zinc	7440-66-6	585	2.90E-02	2.37E-03	7.11E-04	2.37E-03	0.667	No
Hexane	110-54-3	585	1.80E+00	1.47E-01	4.41E-02	1.47E-01	12	No
Pentane	109-66-0	585	2.60E+00	2.12E-01	6.37E-02	2.12E-01	118	No
Toluene	108-88-3	585	3.40E-03	2.78E-04	8.33E-05	2.78E-04	25	No
Napthalene	91-20-3	585	6.10E-04	4.98E-05	1.50E-05	4.98E-05	3.33	No

1. POM is the combination of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene. and are compared against the emission level of benzo(a)pyrene.
2. These pollutants are evaluated individually against the PAH emission level.
3. 585 is based on 24-hr average and 586 pollutants are annual averages

Greenhouse Gas Emissions

	metric tons per year				
	(MMBtu/yr)	CO_2	N_2O	CH_4	$CO_2e^{1,2}$
Total	**50000**	**2,668.24**	**0.05**	**0.05**	**2,684.10**

1. The total CO_2e was calculated using global warming potentials from 40 CFR Part 98, Subpart A, Table A-1
2. The conversion from pounds to metric tons is 2204.6 lb to each metric ton.

Summary

	Pounds per Hour					
Process	PM_{10}	$PM_{2.5}$	CO	NO_x	SO_2	VOC
Receiving	2.95E-01	5.00E-02				
Husking Shed	1.81E-02	3.08E-03				
Sheller - Large	2.46E-02	4.17E-03				
Sheller - Small	1.12E-02	1.90E-03				
Scalper	2.09E-03	3.56E-04				
Sizer 1 - East	0.05	0.01				
Sizer 2 - North	0.14	0.02				
Mill 1	0.16	0.03				
Mill 2	0.16	0.03				
Mill 3	0.11	0.02				
Mill 4	4.23E-02	7.18E-03				
Mill 5	4.23E-02	7.18E-03				
Electric Sorting	7.65E-04	1.31E-04				
Treater & bagline	5.10E-03	8.70E-04				
Seed Vault	1.89E-06	3.30E-07				
Sack turner	0	0				
Dryers	0.62	0.62	6.86	8.16	4.90E-02	0.45
Total	**1.68**	**0.80**	**6.86**	**8.16**	**0.05**	**0.45**

	Tons per Year					
Process	PM_{10}	$PM_{2.5}$	CO	NO_x	SO_2	VOC
Receiving	1.48E-01	2.50E-02				
Husking Shed	1.31E-02	2.22E-03				
Sheller - Large	6.62E-03	1.12E-03				
Sheller - Small	7.36E-04	1.25E-04				
Scalper	6.92E-03	1.17E-03				
Sizer 1 - East	8.65E-02	1.47E-02				
Sizer 2 - North	2.19E-01	3.72E-02				
Mill 1	2.36E-02	4.01E-03				
Mill 2	2.36E-02	4.01E-03				
Mill 3	2.36E-02	4.01E-03				
Mill 4	6.73E-03	1.14E-03				
Mill 5	6.73E-03	1.14E-03				
Electric Sorting	1.98E-03	3.38E-04				
Treater & bagline	1.98E-03	3.38E-04				
Seed Vault	3.67E-04	6.41E-05				
Sack turner	0.00	0.00				
Dryers	0.19	0.19	2.06	2.45	0.01	0.13
Total	**0.76**	**0.28**	**2.06**	**2.45**	**0.01**	**0.13**

Cadmium Modeling

Total Cadmium	6.16E-06	lb/hr
Total MMBtu/hr	83.25	MMBtu/hr
25N	9	MMBtu/hr
17N	11.25	MMBtu/hr
25S	18	MMBtu/hr
17S	15	MMBtu/hr
BLDG 2	16.25	MMBtu/hr
BLDG 8	13.75	MMBtu/hr

Dryer Name	MMBtu/hr
DB1	5
DB2	5
DB3	9
DB4	4.5
DB5	9
DB6	4.5
DB7	5
DB8	3.75
DB9	5
DB10	3.75
DB11	5
DB12	3.75
DB13	3.75
DB14	3.75
DB15	3.75
DB16	5
DB17	3.75

Location	# Sources	Cadmium (lb/hr)	lb/hr/source	Description
25N	2	6.65E-07	3.33E-07	along S
17N	3	8.32E-07	2.77E-07	along S
25S	4	1.33E-06	3.33E-07	along N, along S
17S	6	1.11E-06	1.85E-07	along N, along S
BLDG 2	2	1.20E-06	6.01E-07	1 along W (27'), 1 along E (41')
BLDG 8	3	1.02E-06	3.39E-07	2 along N, 1 along E

Source	X	Y	Release Height (ft)	Initial Horz (ft)	Initial Vert (ft)	Cadmium ER (lb/hr)	Modeling Results ($\mu g/m^3$)	AACC (µg/m3)	% of AACC
25N_1	524,014.35	4,835,144.66	10	14.88	9.30	3.33E-07	1.10E-04	5.60E-04	19.64%
25N_2	524,029.93	4,835,144.66	10	14.88	9.30	3.33E-07			
17N_1	524,051.48	4,835,145.10	10	11.63	9.30	2.77E-07			
17N_2	524,063.24	4,835,145.10	10	11.63	9.30	2.77E-07			
17N_3	524,075.99	4,835,145.10	10	11.63	9.30	2.77E-07			
25S_1	524,014.23	4,835,132.24	10	7.73	9.30	3.33E-07			
25S_2	524,031.43	4,835,132.24	10	7.73	9.30	3.33E-07			
25S_3	524,031.43	4,835,120.83	10	7.73	9.30	3.33E-07			
25S_4	524,014.23	4,835,120.83	10	7.73	9.30	3.33E-07			
17S_1	524,049.39	4,835,133.00	10	5.81	9.30	1.85E-07			
17S_2	524,064.11	4,835,133.00	10	5.81	9.30	1.85E-07			
17S_3	524,078.98	4,835,133.00	10	5.81	9.30	1.85E-07			
17S_4	524,078.98	4,835,121.95	10	5.81	9.30	1.85E-07			
17S_5	524,064.11	4,835,121.95	10	5.81	9.30	1.85E-07			
17S_6	524,049.39	4,835,121.95	10	5.81	9.30	1.85E-07			
BLDG2_1	524,098.07	4,835,147.43	10	6.28	9.30	6.01E-07			
BLDG2_2	524,145.11	4,835,145.74	10	9.53	9.30	6.01E-07			
BLDG8_1	524,056.03	4,835,104.58	12.5	13.95	11.63	3.39E-07			
BLDG8_2	524,069.99	4,835,104.58	12.5	13.95	11.63	3.39E-07			
BLDG8_3	524,079.56	4,835,091.49	12.5	19.53	11.63	3.39E-07			

% Weight Loss

	TONS	% LOSS	NET WEIGHT
RAW	25000		
HUSKING		0.25	-18,750.00
DRYING		0.25	14,062.50
SHELLING		0.25	-10,546.88
SCALPING		0.06	9,914.06
SIZING		0.05	-9,418.36
MILLING		0.15	8,005.61
SANCORE & PICKING		0.03	-7,765.44
FINAL SEED WT.			**7765.44**

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: July 26, 2019

TO: Christina Boulay, Permit Writer, Air Program

FROM: Darrin Mehr, Modeling Review Analyst, Air Program

PROJECT: P-2017.0008 PROJ 62249, Increase in Daily and Annual Seed Throughput Limits for Crookham Company located in Caldwell, Idaho.

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs) as it relates to air quality impact analyses.

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a Non-carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
ASOS	Automated Surface Observing System
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
Cd	Cadmium
CFR	Code of Federal Regulations
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
Crookham	Crookham Company (Permittee)
DEM	Digital Elevation Map
DEQ	Idaho Department of Environmental Quality
DV	Design Values
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
GEP	Good Engineering Practice
hr	hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
lb/hr	Pounds per hour
m	Meters
m/sec	Meters per second
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NAD83	North American Datum of 1983
NED	National Elevation Dataset
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen
NWS	National Weather Service
O_3	Ozone
Pb	Lead
PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	parts per billion

PRIME	Plume Rise Model Enhancement
PSD	Prevention of Significant Deterioration
PTC	Permit to Construct
PTE	Potential to Emit
PVMRM	Plume Volume Molar Ratio Method
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
Stantec	Stantec Consulting (Permittee's permitting and modeling consultant)
TAP	Toxic Air Pollutant
tpd	Tons per day
tpy	Tons per year
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compounds
°F	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

Crookham Company (Crookham) submitted a Permit to Construct (PTC) application for a modification to their existing facility located in Caldwell, Idaho. Project-specific air quality analyses involving atmospheric dispersion modeling of estimated emissions associated with the proposed modification were submitted to DEQ to demonstrate that applicable emissions do not result in violation of a National Ambient Air Quality Standard (NAAQS) or Toxic Air Pollutant (TAP) increment as required by the Idaho Administrative Procedures Act 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03). This memorandum provides a summary of the applicability assessment for analyses and air impact analyses used to demonstrate compliance with applicable NAAQS and TAP increments, as required by Idaho Air Rules Section 203.02 and 203.03.

Stantec Consulting (Stantec) on behalf of Crookham, prepared the PTC application and performed ambient air impact analyses for this project. DEQ review of submitted data and DEQ analyses summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the air impact analyses used to demonstrate that estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of any applicable air quality standard. This review did not address/evaluate compliance with other rules or analyses not pertaining to the air impact analyses. Evaluation of emission estimates was the responsibility of the DEQ permit writer and is addressed in the main body of the DEQ Statement of Basis, and emission calculation methods were not evaluated in this modeling review memorandum.

Table 1 presents key assumptions and results to be considered in the development of the permit. Idaho Air Rules require air impact analyses be conducted in accordance with methods outlined in 40 CFR 51, Appendix W *Guideline on Air Quality Models* (Appendix W). Appendix W requires that air quality impacts be assessed using atmospheric dispersion models with emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

The submitted information and analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emission estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that estimated potential/allowable emissions are at a level defined as below regulatory concern (BRC) and do not require a NAAQS compliance demonstration; b) that predicted pollutant concentrations from emissions associated with the project as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or c) that predicted pollutant concentrations from emissions associated with the project, when appropriately combined with co-contributing sources and background concentrations, were below applicable NAAQS at ambient air locations where and when the project has a significant impact; 5) showed that TAP emission increases associated with the project will not result in increased ambient air impacts exceeding allowable TAP increments. This conclusion assumes that conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition. The DEQ permit writer should use Table 1 and other information presented in this memorandum to generate appropriate permit provisions/restrictions to assure emissions do not exceed applicable regulatory thresholds requiring further analyses and to assure the requirements of Appendix W are met regarding emissions representative of design capacity or permit allowable rates.

Summary of Submittals and Actions

- June 10, 2019: Regulatory start date.
- June 25, 2019: DEQ requested additional information from Stantec.

- June 27, 2019: Stantec and Crookham provided additional modeling demonstration support information via an email submittal.
- July 3, 2019: Application determined complete by DEQ.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
General Emission Rates. Emission rates used in the air impact analyses, as listed in this memorandum, must represent maximum potential emissions as given by design capacity, inherently limited by the nature of the process or configuration of the facility, or as limited by the issued permit for the specific pollutant and averaging period.	Compliance has not been demonstrated for emission rates greater than those used in the air impact analyses.
Air Impact Analyses for Criteria Pollutant Emissions. Total allowable emission rates of all criteria pollutants are below levels defined as BRC.	Project-specific air impact analyses demonstrating compliance with NAAQS, as required by Idaho Air Rules Section 203.02, are required for pollutant increases above BRC thresholds, or for pollutants having an emissions increase that is greater than Level I modeling applicability thresholds (where the BRC exclusion cannot be used).
Air Impact Analyses for TAP Emissions. Allowable emissions of TAPs other than cadmium (Cd) are below ELs. Analyses demonstrating compliance with Cd TAP increments were performed.	A TAP increment compliance demonstration would be required for any TAPs with emissions above ELs.
Modeling Protocol. A modeling protocol was not submitted and a DEQ modeling protocol conditional approval letter was not issued for this project.	Abbreviated review for this TAPs-only modeling project was not applicable because a protocol was not submitted and approved by DEQ.

[a] Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.

2.0 Background Information

This section provides background information applicable to the project and the facility location for the facility. It also provides a brief description of the applicable air impact analyses requirements for the project.

2.1 Project Description

The Crookham project is an existing permitted facility located in Caldwell, Idaho. This project addresses a short-term and an annual increase in seed throughput at the facility. The current permitted limitations are 500 tpd and 20,000 tpy of raw material received. The raw material receipt throughput limitation will be increased to 600 tpd and 25,000 tpy. A permit condition limiting hours of operation to 3,000 hours per year will be removed. An enforceable limitation on annual final product throughput of 7,765 tpy on a 12-month rolling average basis, will be added.

Pollutant-emitting processes conducted at the facility include the following processes for the production of seed products: husking, shelling, scalping, sizing, milling, electric sorting, treating, and bagging. Seed treatment includes fumigation by phosphine in two treatment chambers. This project did not identify an increase of phosphine emissions.

The affected emissions units are existing natural gas-fired heating units that are not regulated by NSPS or a NESHAP, and the emissions from these sources were determined to be subject to the TAPs screening levels and increments.

2.2 Proposed Location and Area Classification

The facility is located in Caldwell, within Canyon County. (Northing: 4,835,148 m; Easting: 524,139 m; UTM Zone 11). This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$). The area is not classified as non-attainment for any criteria pollutants.

2.3 Air Impact Analyses Required for All Permits to Construct

Idaho Air Rules Sections 203.02 and 203.03:

> *No permit to construct shall be granted for a new or modified stationary source unless the applicant shows to the satisfaction of the Department all of the following:*
>
> ***02. NAAQS.*** *The stationary source or modification would not cause or significantly contribute to a violation of any ambient air quality standard.*
>
> ***03. Toxic Air Pollutants.*** *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Atmospheric dispersion modeling, using computerized simulations, is used to demonstrate compliance with both NAAQS and TAPs. Idaho Air Rules Section 202.02 states:

> ***02. Estimates of Ambient Concentrations.*** *All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51 Appendix W (Guideline on Air Quality Models).*

2.4 Significant Impact Level and Cumulative NAAQS Impact Analyses

If specific criteria pollutant emission increases associated with the proposed permitting project cannot qualify for a BRC exemption as per Idaho Air Rules Section 221, then the permit cannot be issued unless the application demonstrates that applicable emission increases will not cause or significantly contribute to a violation of NAAQS, as required by Idaho Air Rules Section 203.02.

The first phase of a NAAQS compliance demonstration is to evaluate whether the proposed facility/project could have a significant impact to ambient air. Section 3.1.1 of this memorandum describes the applicability evaluation of Idaho Air Rules Section 203.02. The Significant Impact Level (SIL) analysis for a new facility or proposed modification to a facility involves modeling estimated criteria air pollutant emissions from the facility or modification to determine the potential impacts to ambient air. Air impact analyses are required by Idaho Air Rules to be conducted in accordance with methods outlined in Appendix W. Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition.

A facility or modification is considered to have a significant impact on air quality if maximum modeled impacts to ambient air exceed the established SIL listed in Idaho Air Rules Section 006 (referred to as a "significant contribution" in Idaho Air Rules) or as incorporated by reference as per Idaho Air Rules Section 107.03.b. Table 2 lists the applicable SILs.

If modeled maximum pollutant impacts to ambient air from the emission sources associated with a new facility or modification exceed the SILs, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts (typically the design values consistent with the form of the standard) from potential/allowable emissions resulting from the project and emissions from any nearby co-contributing sources (including existing emissions from the facility that are unrelated to the project), and then adding a DEQ-approved background concentration value to the modeled result that is appropriate for the criteria pollutant/averaging-period at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis for the modeling domain.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Impact Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Design Value Used[d]
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 $\mu g/m^3$)	75 ppb[p] (196 $\mu g/m^3$)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
	24-hour	5	365[m]	Maximum 2nd highest[n]
	Annual	1.0	80[r]	Maximum 1st highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 $\mu g/m^3$)	100 ppb[s] (188 $\mu g/m^3$)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

If the cumulative NAAQS impact analysis indicates a potential violation of the standard, the permit may not be issued if the proposed project has a significant contribution (exceeding the SIL) to the modeled violation. If project-specific impacts are below the SIL, then the project does not have a significant contribution to the specific violations.

Compliance with Idaho Air Rules Section 203.02 is generally demonstrated if: a) applicable specific criteria pollutant emission increases are at a level defined as BRC, using the criteria established by DEQ regulatory interpretation[1]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling all emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.5 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other*

contaminants, injure or unreasonably affect human or animal life or vegetation.

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the total project-wide emission increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emission increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60, 61, or 63, then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion.

3.0 Analytical Methods and Data

This section describes the methods and data used in the analyses to demonstrate compliance with applicable air quality impact requirements. The DEQ Statement of Basis provides a discussion of the methods and data used to estimate criteria and TAP emission rates.

3.1 Emission Source Data

Emissions of criteria pollutants and TAPs resulting from operation of the proposed modification were estimated by Stantec for various applicable averaging periods. The calculation of potential emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emission estimates is not addressed in this modeling memorandum. DEQ air impact analysts are responsible for assuring that potential emission rates provided in the emission inventory are properly used in the model. The rates listed must represent the maximum allowable rate as averaged over the specified period.

Emission rates used in the impact modeling applicability analyses and any modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emission inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emission inventory or proposed permit allowable emission rates.

3.1.1 Modeling Applicability and Modeled Criteria Pollutant Emission Rates

If project-specific emission increases for criteria pollutants would qualify for a BRC permit exemption as

per Idaho Air Rules Section 221 if it were not for potential emissions of one or more pollutants exceeding the BRC threshold of 10 percent of emissions defined by Idaho Air Rules as significant, then a NAAQS compliance demonstration may not be required for those pollutants with emissions below BRC levels. DEQ's regulatory interpretation policy of exemption provisions of Idaho Air Rules is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant.[1]" The interpretation policy also states that the exemption criteria of uncontrolled potential to emit (PTE) not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. The BRC exemption cannot be used to exempt a project from a pollutant-specific NAAQS compliance demonstration in most cases where a PTC is required for the action regardless of emission quantities, such as the modification of an existing emission or throughput limit.

A NAAQS compliance demonstration must be performed for pollutant increases that would not qualify for the BRC exemption from the requirement to demonstrate compliance with NAAQS.

Site-specific air impact modeling analyses may not be necessary for some pollutants, even where such emissions do not qualify for the BRC exemption. DEQ has developed modeling applicability thresholds, below which a site-specific modeling analysis is not required. DEQ generic air impact modeling analyses that were used to develop the modeling thresholds provide a conservative SIL analysis for projects with emissions below identified threshold levels. Project-specific modeling applicability thresholds are provided in the *Idaho Air Modeling Guideline*[2]. These thresholds were based on assuring an ambient impact of less than the established SIL for specific pollutants and averaging periods.

If total project-specific emission rate increases of a pollutant are below Level I Modeling Applicability Thresholds, project-specific air impact analyses are not necessary for permitting. Use of Level II Modeling Applicability Thresholds is conditional, and requires DEQ approval. DEQ approval is based on dispersion-affecting characteristics of the emission sources such as stack height, stack gas exit velocity, stack gas temperature, distance from sources to ambient air, presence of elevated terrain, and potential exposure to sensitive public receptors.

NAAQS compliance demonstrations were not required for this project since the submitted application demonstrated that the project qualified for the BRC NAAQS compliance demonstration exemption.

Table 3 provides a comparison between facility-wide allowable emissions and BRC levels.

Table 3. CRITERIA POLLUTANT NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY			
Criteria Pollutant	**BRC Level (ton/year)**	**Applicable Facility-Wide PTE Emissions (ton/year)**	**Air Impact Analyses Required?**
PM_{10}[a]	1.5	0.76	No
$PM_{2.5}$[b]	1.0	0.28	No
Carbon Monoxide (CO)	10.0	2.06	No
Sulfur Dioxide (SO_2)	4.0	0.01	No
Nitrogen Oxides (NOx)	4.0	2.45	No
Lead (Pb)	0.06	Not listed in emissions inventory but assumed to be less than 0.06 ton/year	No
Volatile Organic Compounds (VOCs)	4.0	0.13	No

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
b. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NOx, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource-intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting. Addressing secondary formation of O_3 within the context of permitting a new stationary source has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."*
>
> *The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."*

DEQ determined it was not appropriate or necessary to require a quantitative source-specific O_3 impact analysis because allowable emission estimates of VOCs and NOx are below the 100 tons/year threshold. Additionally, both VOC and NOx emissions satisfied BRC exemption criteria.

3.1.2 TAPs Modeling Applicability

TAP emission regulations under Idaho Air Rules Section 210 are only applicable for new or modified sources constructed after July 1, 1995.

Project-related emissions of cadmium exceed the applicable emission screening levels (ELs) of Idaho Air Rules Section 585 or 586. Air impact modeling analyses were then required to demonstrate that

maximum impacts of cadmium are below applicable ambient increment standards expressed in Idaho Air Rules Section 585 and 586 as AACs and AACCs.

Cadmium is a carcinogenic TAP that is regulated on a long-term averaging basis. Therefore, the appropriate emission rates for impact analyses are maximum annual emissions, expressed as an average pound/hour value over an 8,760-hour period.

Table 4 provides a summary of TAP emission increases for the project for those TAPs that had an increase exceeding the ELs of Idaho Air Rules Section 585 or 586.

Table 4. TAP EMISSION INCREASES THAT TRIGGER MODELING

Toxic Air Pollutant	Emissions (lb/hr)[a]	Screening Emissions Level (lb/hr)
Cadmium[b]	6.16E-06	3.7E-06

a. Pounds per hour.
b. Carcinogenic TAP. ELs are annual maximum emissions expressed as pounds/hour. The emissions rate is the annual emissions divided by 8,760 hours/year.

3.1.3 Modeled Emission Rates

Table 5 provides a summary of the modeled emissions rates for this project. All sources were modeled at the hourly emissions rates for 8,760 hours per year.

Table 5. MODELED CADMIUM TAP EMISSION RATES

Source	Cadmium[a] Emissions (lb/hr)[b]
25N_1	3.33E-07
25N_2	3.33E-07
17N_1	2.77E-07
17N_2	2.77E-07
17N_3	2.77E-07
25S_1	3.33E-07
25S_2	3.33E-07
25S_3	3.33E-07
25S_4	3.33E-07
17S_1	1.85E-07
17S_2	1.85E-07
17S_3	1.85E-07
17S_4	1.85E-07
17S_5	1.85E-07
17S_6	1.85E-07
BLDG2_1	6.01E-07
BLDG2_2	6.01E-07
BLDG8_1	3.39E-07
BLDG8_2	3.39E-07
BLDG8_3	3.39E-07

a. Carcinogenic TAP. ELs are annual maximum emissions expressed as pounds/hour. The emissions rate is the annual emissions divided by 8,760 hours/year.
b. Pounds per hour.

3.1.4 Emission Release Parameters

Emission point release parameters were based on information provided by the applicant or DEQ assumptions based on similar sources with a margin of conservatism (less favorable dispersion characteristics such as shorter stack heights, lower flow volumes, etc). Table 6 lists the release parameters for the volume sources in the facility.

Crookham's sources are natural gas-fired dryer units that provide heat to the seed drying ventilation air. Large openings in the sides of buildings exhaust emissions from the drying areas. The openings were modeled as elevated volume sources. Stantec and Crookham provided release parameter justification in the June 27, 2019, email submittal[3] describing Crookham staff re-measurement of openings modeled as elevated volume sources.

DEQ observes that the large openings would create low exit velocities. Also, because the sources are openings in the side wall of the buildings they exhaust with a horizontal release orientation. Modeling these openings as horizontal point sources would minimize the vertical momentum component of exhaust plume dispersion. DEQ agrees modeling the sources as elevated volume sources is appropriate for these sources. DEQ obtained Figure 1 below using Google Earth Street View[4]. The figure shows a portion of one of the seed drying buildings. Note the large openings in the building walls and the air supply system on the building roof.

Release heights were established by Stantec at ½ of the height of the openings. Horizontal initial dispersion dimensions were calculated using the assumption that the sources are on or adjacent to a building by dividing the measured width of the opening by 4.3. Vertical initial dispersion dimensions were calculated using the measured opening height divided by 2.15. DEQ agrees the dispersion dimensions were appropriately estimated. Release parameter values were taken from the June 27, 2019, submittal.

Figure 1. View of a Portion of a Drying Building

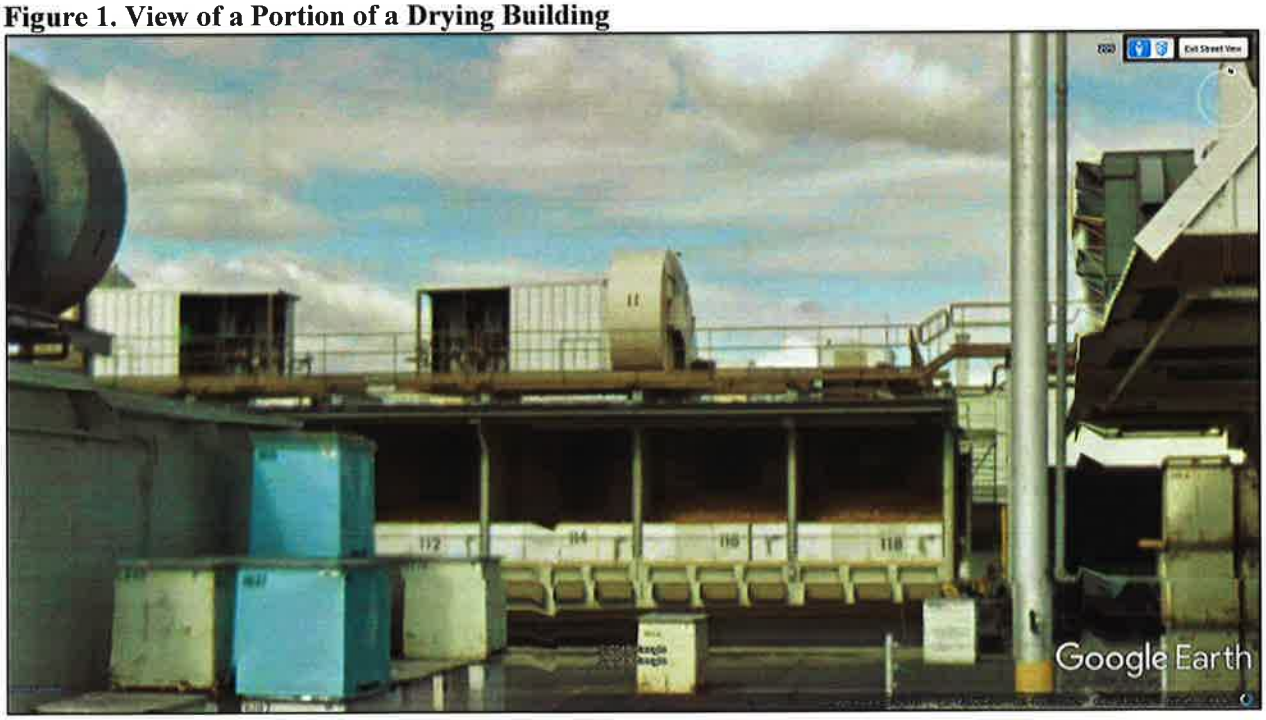

Table 6. VOLUME SOURCE RELEASE PARAMETERS						
Source	Description	UTM[a] Coordinates		Release Height (m)	Horizontal Dimension (m)	Vertical Dimension (m)
		Easting - X (m)[b]	Northing - Y (m)			
25N_1	Building 25 N	524,014.4	4,835,144.7	3.0	4.2	2.8
25N_2	Building 25 N	524,029.9	4,835,144.7	3.0	4.2	2.8
17N_1	Building 17 N	524,051.5	4,835,145.1	3.0	3.5	2.8
17N_2	Building 17 N	524,063.2	4,835,145.1	3.0	3.5	2.8
17N_3	Building 17 N	524,076.0	4,835,145.1	3.0	3.5	2.8
25S_1	Building 25 S	524,014.2	4,835,132.2	2.9	2.1	2.7
25S_2	Building 25 S	524,031.4	4,835,132.2	2.9	2.1	2.7
25S_3	Building 25 S	524,031.4	4,835,120.8	2.9	2.1	2.7
25S_4	Building 25 S	524,014.2	4,835,120.8	2.9	2.1	2.7
17S_1	Building 17 S	524,049.4	4,835,133.0	2.9	1.8	2.7
17S_2	Building 17 S	524,064.1	4,835,133.0	2.9	1.8	2.7
17S_3	Building 17 S	524,079.0	4,835,133.0	2.9	1.8	2.7
17S_4	Building 17 S	524,079.0	4,835,122.0	2.9	1.8	2.7
17S_5	Building 17 S	524,064.1	4,835,122.0	2.9	1.8	2.7
17S_6	Building 17 S	524,049.4	4,835,122.0	2.9	1.8	2.7
BLDG2_1	Building 2	524,098.1	4,835,147.4	3.4	1.9	2.8
BLDG2_2	Building 2	524,145.1	4,835,145.7	3.4	2.9	2.8
BLDG8_1	Building 8	524,056.0	4,835,104.6	3.4	4.3	3.1
BLDG8_2	Building 8	524,070.0	4,835,104.6	3.4	4.3	3.1
BLDG8_3	Building 8	524,079.6	4,835,091.5	3.4	6.4	3.1

a. Universal Transverse Mercator, Zone 11, NAD83.
b. Meters.

3.2 Background Concentrations

Background concentrations are used if a cumulative NAAQS impact analysis is needed to demonstrate compliance with applicable NAAQS. Cumulative NAAQS analyses were not required for this project because emissions of all criteria pollutants were below levels defined as BRC, and as such, a NAAQS compliance demonstration was not required for these emissions. Ambient background concentrations were not used in this project.

3.3 Impact Modeling Methodology

This section describes the modeling methods used by the applicant and DEQ to demonstrate preconstruction compliance with applicable air quality standards.

3.3.1 General Overview of Impact Analyses

Crookham and Stantec performed the project-specific air pollutant emission inventory and air impact analyses that were submitted with the application and DEQ generated the project's verification analyses based on revised release parameters for some of the project's emission sources submitted by the applicant and their consultant. Emission rates were unaltered. The submitted information/analyses, in combination with results from DEQ's air impact analyses, demonstrate compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum.

Table 7 provides a brief description of parameters used in the modeling analyses.

Table 7. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
General Facility Location	Caldwell, Idaho	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 18081.
Meteorological Data	Boise surface data; Boise upper air data	See Section 3.3.4 of this memorandum for additional details of the meteorological data.
Terrain	Considered	A National Elevation Dataset (NED) file was acquired from the USGS for the surrounding area. AERMAP version 18081 was used by Stantec to process terrain elevation data for all buildings, emission sources, and receptors. See Section 3.3.5 for more details.
Building Downwash	Not Considered	Building downwash is not considered for elevated volume sources. See Section 3.3.6.
Receptor Grid	**TAPs Analysis** The selection of receptors for use in the TAPs Analyses is as follows (see Section 3.3.8):	
	Grid 1	25-meter spacing along the ambient air boundary
	Grid 2	25-meter spacing in a 625 meter (easting) by 375 meter (northing) grid centered on the facility
	Grid 3	50-meter spacing in a 950 meter (easting) by 700 meter (northing) grid centered on the facility
	Grid 4	100-meter spacing in a 1,500 meter (easting) by 1,300 meter (northing) grid centered on the facility
	Grid 5	500-meter spacing in a 6,000 meter (easting) by 5,500 meter (northing) grid centered on the facility
	Grid 6	1,000-meter spacing in a 12,000 meter (easting) by 11,000 meter (northing) grid centered on the facility

3.3.2 Modeling Methodology

Project-specific modeling and other required impact analyses were generally conducted using data and methods described in the *Idaho Air Quality Modeling Guideline*[2].

3.3.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of ambient concentrations be based on air quality models specified in Appendix W. The refined, steady-state, multiple-source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight-line trajectory of ISCST3, but it includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD version 18081 was used by DEQ for the modeling analyses to evaluate impacts of the facility. This version was the current version at the time the application was received by DEQ.

3.3.4 Meteorological Data

DEQ processed a meteorological dataset from Boise, Idaho (KBOI; station ID 726810-24131) covering the years 2012-2016. The upper air soundings required by AERMET were obtained from the Boise airport station (site ID 24131). Surface characteristics were determined by DEQ staff using AERSURFACE version 13016. DEQ modeling staff evaluated annual moisture conditions for the AERSURFACE runs based on thirty years of Boise airport precipitation data. Conditions were determined to be "wet" for 2015 and "dry" for no years. The years 2012, 2013, 2014, and 2016 were determined to be "average" for precipitation. Average moisture content is defined as within a 30

percentile of the 30-year mean of 11.2 inches. Calms were low at 0.7 percent, and less than 0.4 percent of the data were missing from the 5-year record. AERMINUTE version 15272 was used to process Automated Surface Observing Systems (ASOS) wind data for use in AERMET. AERMET version 18081 was used to process surface and upper air data and to generate a model-ready meteorological data input file. The "adjust u star" (ADJ_U*) option was applied in AERMET to enhance model performance during low wind speeds under stable conditions. DEQ determined that these data are adequately representative of the meteorology at the Crookham site for minor source permitting.

3.3.5 Effects of Terrain on Modeled Impacts

Submitted ambient air impact analyses used terrain data extracted from United States Geological Survey (USGS) National Elevation Dataset (NED) files. DEQ spot-checked the elevations receptors along the ambient air boundary and facility structure against elevation values in Google Earth and found the model setup matched well with Google Earth elevation data. The highest ambient impacts for this project are located along the ambient air boundary of the facility where the terrain is flat. The USGS NED file was not included in the modeling demonstration files due to a download error. DEQ reran AERMAP using an available NED file covering the same area and determined that receptor elevations for all areas of concern matched well and Crookham's modeling demonstration used appropriate receptor elevation and hill height scale values.

The terrain preprocessor AERMAP version 18081 was used by Stantec to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses those heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain.

3.3.6 Facility Layout and Downwash

DEQ verified proper identification of the site location, equipment locations, and the ambient air boundary by comparing a graphical representation of the modeling input file to plot plans submitted in the application. Aerial photographs on Google Earth (available at https://www.google.com/earth) were also used to assure that horizontal coordinates were accurate as described in the application. The project modeled elevated volume sources only. Building downwash effects are not directly applied to volume sources. Volume sources indirectly account for downwash by using building dimensions to calculate initial horizontal and vertical plume dimensions.

3.3.7 Ambient Air Boundary

Ambient air is defined in Section 006 of the Idaho Air Rules as "that portion of the atmosphere, external to buildings, to which the general public has access." To exclude areas of the site from consideration as ambient air, the permittee must have the legal and practical ability to control access to such areas of the site. The ambient air boundary was established at the facility's property boundary.

3.3.8 Receptor Network

The receptor grid used in DEQ's analyses met the minimum recommendations specified in the *Idaho Air Quality Modeling Guideline*[2] and DEQ determined that it was adequate to resolve maximum modeled impacts.

Table 7 describes the receptor network used in the submitted modeling analyses. The receptor grids used in the model provided good resolution of the maximum design concentrations for the project and provided extensive coverage. The full receptor grid was used for TAPs ambient air impact analyses. DEQ determined that the receptor network was effective in reasonably assuring compliance with applicable air quality standards at all ambient air locations.

3.3.9 Good Engineering Practice Stack Height

An allowable good engineering practice (GEP) stack height may be established using the following equation in accordance with Idaho Air Rules Section 512.03.b:

$H = S + 1.5L$, where:

H = good engineering practice stack height measured from the ground-level elevation at the base of the stack.

S = height of the nearby structure(s) measured from the ground-level elevation at the base of the stack.

L = lesser dimension, height or projected width, of the nearby structure.

All emission sources in this project emit at heights below GEP stack height. Therefore, consideration of downwash caused by nearby buildings would be required if modeling was performed for point sources. However, Crookham's submitted ambient impact analyses modeled all emissions sources as volume sources, negating stack GEP issues.

4.0 NAAQS and TAPs Impact Modeling Results

4.1 Results for NAAQS Analyses

A NAAQS impact analysis was not performed for the Crookham facility. Idaho Air Rules Section 203.02, requiring air impact analyses demonstrating compliance with NAAQS, is not applicable to pollutants having project emissions increase that are less than BRC levels, provided the project would have qualified for a BRC permitting exemption except for the emissions levels of another criteria pollutant exceeding the ton/year BRC threshold.

4.2 Results for TAPs Impact Analyses

Dispersion modeling was required to demonstrate compliance with TAP increments specified by Idaho Air Rules Section 585 and 586 for those TAPs with project-related emissions exceeding screening emission levels (ELs). Table 7 lists the maximum modeled impacts for specific TAPs. All modeled impacts are below applicable AACs and AACCs.

Table 7. TAP AIR IMPACT ANALYSIS RESULTS			
TAP	**Maximum Modeled Impact ($\mu g/m^3$)[a]**	**AAC or AACC ($\mu g/m^3$)**	**Percent of AAC/ AACC**
Cadmium[b]	1.1E-04 (1.2E-04)[c]	5.6E-04	20% (21%)[c]

a. Micrograms per cubic meter.

b. Carcinogenic TAP. Modeled impact and AACC represent annual or period-average concentration.

c. Design impact is the maximum highest 1st high impact based on DEQ verification analysis using revised volume source release parameters determined by Crookham staff on-site physical measurements, submitted via a June 27, 2019, email from Stantec, on behalf of Crookham.

5.0 Conclusions

The information submitted with the PTC application, combined with DEQ air impact analyses, demonstrated to DEQ's satisfaction that emissions from the Crookham facility will not cause or significantly contribute to a violation of any applicable ambient air quality standard or TAP increment.

References

1. *Policy on NAAQS Compliance Demonstration Requirements.* Idaho Department of Environmental Quality Policy Memorandum. July 11, 2014.

2. *State of Idaho Guideline for Performing Air Quality Impact Analyses*. Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.

3. Project document email submittal dated June 27, 2019, titled "Crookham Building Update," with Attachments, from Eric Clark, P.E., Project Engineer, Stantec, to Darrin Mehr, Air Quality Dispersion Modeling Analyst, DEQ, Content Manager Record No. 2019AAG1261.

4. Google Earth and Google Earth Streetview. ©2018 Google LLC, used with permission. Google and the Google logo are registered trademarks of Google, LLC.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on July 23, 2019:

Facility Comment: Permit Condition 2.1 change to the following, "Crookham Company processes various types of seeds from both local and foreign suppliers. The seeds are dried, treated, and bagged. Six phosphine fumigation cells are used in each of the two chambers and eliminates any pests from the seeds.

From, "Crookham Company processes various types of seeds from both local and foreign suppliers. The seeds are dried, treated, and bagged. Phosphine fumigation is used to eliminate any pests from the seeds within one or two cells which consist of six fumigation chambers depending on throughput.

DEQ Response: This is consistent with the modeling calculations; requested changes have been incorporated into the permit.

Facility Comment: Permit Condition 2.2 Emission Limits, Crookham requests removal of this requirement because there is no realistic way to track the hourly or annual emissions per process. Additionally, it is somewhat redundant with PC 2.4 as these values correlate directly to the throughput limits. If DEQ wants the table to remain, can the description language be modified to ensure that it is for informational purposes only?

DEQ Response: Permit Condition 2.2 is a standard permit condition. The emission limits listed are consistent with the modeled throughput in the application. Permit Condition 2.4 sets the throughput limit of the permit, while Permit Condition 2.2 sets the emission limits of the seed processing operations. The phosphine emission limit associated with the daily material use has also been included in the this permit condition.

Facility Comment: Permit Condition 2.5, there are six cells per chamber. My email the other day may have been somewhat confusing. Also, Crookham is amenable to having the condition and the monitoring requirement reflect the number of cells rather than mass.

DEQ Response: The daily limit is based off of a total of 12 cells. This accounts for 6 cells per chamber, at two chambers. This is also consistent with the modeling analysis which determined the daily limit to ensure compliance with the 24 hour toxic air pollutant emission limit. As emissions are generated through material use, the permit condition shall contain mass.

Facility Comment: Permit Condition 2.8, incorporates number of cells rather than mass.

DEQ Response: Emissions are generated through material use; the permit condition shall contain mass.

Facility Comment: Permit Condition 3.3, Please adjust description language to reflect for informational purposes only as the compliance is met by meeting PCs 3.5 and 3.6. Ensure that Table number is correct. Should be 3.2??

DEQ Response: Table number has been corrected. Permit Condition 3.3 is a standard permit condition. The emission limits listed are consistent with the modeled throughput in the application. Permit Condition 3.5 and 3.6 sets the throughput limit and fuel type of the permit, while Permit Condition 3.3 sets the emission limits of the dryer operations.

Facility Comment: Permit Condition 3.6, all of the monthly bills are based on MMbtu as are Crookham's internal records.

DEQ Response: MMBtu is the capacity of all the heaters. DEQ verified with Intermountain Gas Company on July 25, 2019, gas is billed in cubic feet per month. Emissions are generated on material usage therefore the material usage and not the capacity shall remain in permit condition 3.6.

Facility Comment: Permit Condition 3.6 change 49.02 MMscf/yr to 50,000 MMBtu/yr.

DEQ Response: Natural gas usage of 49.02 MMscf/yr was used in the application, engineering analysis, and modeling analysis, this usage shall remain unchanged.

Facility Comment: Permit Condition 3.7 change MMscf/yr to MMBtu/yr

DEQ Response: This permit condition shall remain unchanged to be consistent with and demonstrate compliance with permit condition 3.6.

Facility Comment: Permit Condition 4.2 1st paragraph and 1st bullet point change, "shall" to" may". 5th Bullet point change, "or DEQ approved alternative" to "see no see" per Boise Regional Office approved method.

DEQ Response: The word, "shall" is standard IDEQ verbiage and shall remain unchanged. The fugitive dust requirements in permit condition 4.2 are standard IDEQ permit requirements and shall remain unchanged. However, permit condition 4.3 allows the facility the flexibility to use Method 22 or a DEQ-approved alternative method to demonstrate compliance with permit condition 4.2.

APPENDIX D – PROCESSING FEE

PTC Processing Fee Calculation Worksheet

Instructions:
Fill in the following information and answer the following questions with a Y or N. Enter the emissions increases and decreases for each pollutant in the table.

Company: Crookham Company
Address: 301 W. Warehouse St.
City: Caldwell
State: Idaho
Zip Code: 83605
Facility Contact: Gregg Peterson
Title: PE Manager
AIRS No.: 115114

N — Does this facility qualify for a general permit (i.e. concrete batch plant, hot-mix asphalt plant)? Y/N

Y — Did this permit require engineering analysis? Y/N

N — Is this a PSD permit Y/N (IDAPA 58.01.01.205.04)

Emissions Inventory			
Pollutant	Annual Emissions Increase (T/yr)	Annual Emissions Reduction (T/yr)	Annual Emissions Change (T/yr)
NO_X	2.5	0	2.5
SO_2	0.0	0	0.0
CO	2.1	0	2.1
PM10	0.5	0.51	-0.1
VOC	0.1	0	0.1
Total:	5.1	0.51	**4.6**
Fee Due	**$ 2,500.00**		

Comments: